

WHAT IS CLAIMED IS:

1. A method for forming hydrogel microspheres which will load a protein from aqueous solution, comprising the steps of

a) forming an aqueous solution of hydrogel precursors that are water soluble, denoted a first aqueous solution, where at least one of the hydrogel precursors functions both as a crosslinker and as a monomer in hydrogel formation,

b) admixing with the first aqueous solution a second aqueous solution where the second aqueous solution comprises polymer dissolved in water where the polymer is one that at the concentration of said polymer which is present with any solubility reducer that is present, forms on said admixing an aqueous phase which is immiscible with said first aqueous solution, said second aqueous solution being admixed with the first aqueous solution in a relative amount whereby it will be the continuous phase on formation of an emulsion from the admixture of the first and second aqueous solutions,

c) forming an emulsion where the second aqueous solution is the continuous phase and the first aqueous solution is the disperse phase and the disperse phase is constituted of spheres of diameter ranging from 25 to 60 μm as measured by laser diffraction,

d) polymerizing the hydrogel precursors of the disperse phase to form hydrogel microspheres,

e) collecting the hydrogel microspheres.

2. The method of Claim 1 where a first hydrogel precursor of the first aqueous solution that functions as both a monomer and as a crosslinker in hydrogel formation is poly(ethylene glycol) diacrylate where the poly(ethylene glycol) has a weight average molecular weight ranging from 2,000 to 35,000.

3. The method of Claim 2 where a second hydrogel precursor of the first aqueous solution is one that causes the resulting hydrogel to lose water when a critical solution temperature is exceeded.

4. The method of Claim 3 where the second hydrogel precursor is N-isopropylacrylamide.

5. The method of Claim 4 where the polymer of the second aqueous solution is a water-soluble polysaccharide.

6. The method of Claim 5 where the polymer of the second aqueous solution is dextran having a weight average molecular weight ranging from 40,000 to 80,000.

7. The method of Claim 6 where the second aqueous solution contains a constituent to reduce the solubility of the dextran in water so that a two-phase aqueous system can be formed on the admixture of step (b).

8. An injectable microsphere which can be loaded with cytokine from aqueous solution.

9. The injectable microsphere of Claim 8 which is a hydrogel formed by polymerizing of polyethylene glycol diacrylate where the polyethylene glycol has a weight average molecular weight ranging from 2,000 to 35,000, and N-isopropylacrylamide.